or age; after that, he wears as special badge a collar made of a polished section of the cocoa-nut palm stem with ends of brass.

The women go about with a curious staff ornamented with brass; the usual ornaments are armlets of brass wire, bracelets cut out of Tridacna-shell, and ear-rings of the same material or of metal, and beads. The clothes used to be, and in the southern districts are still, entirely made of beaten bark.

Their idols are roughly carved wooden figures, and both they and the still more primitive carvings representing dead relations vividly recall the idols and the *Karwars* of the Western Papuans. Each village has its chief, and usually war to the knife is waging between one village and the other. This renders a thorough exploration of Nias far from easy.

Dr. Modigliani certainly lost no time, and did his very best; and although quite new to such explorations, in a very short time, with rare energy and perseverance, surmounting many difficulties and not slight dangers, he has succeeded in bringing home most interesting and ample information on the people, extensive ethnological and anthropological collections, important zoological series, and a most interesting sample of the local flora, amongst which are some new species of the singular ant-plants (*Myrmecodiæ*) now being illustrated by Dr. Beccari.

I must say in conclusion that I do not know of any traveller so young and inexperienced who in so short a time (Dr. Modigliani was absent from Florence altogether just eleven months) has succeeded in doing so much and so well.

HENRY H. GIGLIOLI

Royal Museum, Florence, January 22

"Lepidosiren paradoxa"

ZOOLOGISTS will be interested to hear of the capture of a fine specimen of this the rarest of the Dipnoi. Only a few weeks ago I received from my friend Dr. J. Barbosa Rodriguez, the learned and energetic Director of the Museu Botanico do Amazonas, at Manaós, a very fine specimen of the *Lepidosiren*, captured some time last August in that neighbourhood. This specimen is well preserved in alcohol; it measures 85 centimetres in length, with a girth behind the pectorals of 28 centimetres. On opening it I found that it is a female, the ovaries being well laden with well-developed ova; unfortunately the alcohol had not been let into the visceral cavity, and none of the internal organs were in a condition to be successfully investigated. I found the pericardium singularly large and thick. The body is cylindrical, but quite flat along the abdominal surface, where the scales are also bigger, thicker, and of a lighter colour. The short caudal region is much compressed. There are no true median fins except the irregularly rounded caudal, which extends merely as a slightly marked keel to about the middle of the back. The fin-rays on the caudal portion are close together, cartilaginous, and quite hidden by the skin; pectorals and ventrals without traces of membranous edging and rays; the former are slender and compressed, the latter conical and considerably stouter. The entire body, except the head in front of the eyes and the paired fins, is covered with moderate cycloid scales—thicker, as I observed, on the *abdominal cuirasse*, extending from the chin to the anus and composed of about ten longitudinal rows of scales. Except along this ventral stripe, which is of a whitish colour, the animal is generally of a dark brownish purple, with darker indistinct blotches. The double lateral line is dark; it reticulates on the cheeks and around the eyes. These are quite rudimentary, and show under the skin as a whitish spot; they remind me of the eyes of the two *Gymnotus* which I saw alive in the Insect House at the London Zoological Gardens last October. The branchial openings are very narrow, protected by a thick fleshy flap: there are no traces of external branchial appendages, indeed, even the internal branchiæ cannot be seen through the deep, narrow, branchial slit. The mouth is terminal, with well-developed fleshy lips; there are two small conical vomerine teeth; the maxillary and mandibular dental plates are very similar in size and shape; fleshy pads fit into the spaces between the dental ridges. The tongue is thick, smooth, and fleshy, with a rounded point. Four branchial clefts can be made out on each side in the pharynx, the fourth is much reduced; the three free branchial arches are fringed with conical papillæ. The palate and mucous membrane of the mouth is white and quite smooth; the pads along the dental plates are papillous. The anus is exactly 10 millimetres on the left of the mesial line; it is 8 millimetres in diameter, and surrounded with a border in deep folds. I had forgotten to mention the nostrils: both pairs are *inside* the mouth; the anterior ones, just within the upper lip, are ovoid, transverse, without flap or valve; the posterior pair are situated just outside the hinder ridge of the maxillary dental plate, they are ovoid and longitudinal.

I need hardly insist on the importance of the capture of this new specimen of *Lepidosiren*. As far as I am aware, this is the *fourth* known; there are, besides, Natterer's two preserved at Vienna, and Castelnau's one in the Paris Museum. More recent explorers have utterly failed to find any, although an active search was made by several. Only recently I heard from a high authority the expression of a doubt as to the existence of such a creature as the South American *Lepidosiren*!

I may finally state that, evidently prompted by his friendship for me, Dr. Barbosa Rodriguez, seeing, as he believed, distinctions in his specimen, sent a brief description to a Rio scientific periodical, naming it *Lepidosiren gigliolina;* this before forwarding the specimen to me. I have not yet seen his description, nor am I in a position to decide as to any distinction existing between this and the other three existing specimens. I can only say that I consider such a difference very unlikely. I suppose that, like *Ceratodus*, *Lepidosiren* is liable to considerable individual variation. Lastly, I believe it not unlikely that *Lepidosiren* may be on the verge of extinction; that would account for its rarity.

HENRY H. GIGLIOLI

Royal Museum, Florence, January 22

The Coal-Dust Theory

SOME of the facts elicited at the adjourned inquest on the bodies of the twenty-eight persons who lost their lives in an explosion at Elemore pit on December 2 last, appear to have a direct bearing upon the coal-dust theory, and are therefore worthy of being recorded. It will be remembered that the inquest was adjourned until January 18, when it was re-opened; it was concluded on the following day. The verdict of the jury was as follows:—

"That Ralph Fishburn and others met their deaths by an explosion in the George Low Main seam, Elemore Colliery, on the morning of December 2, 1886; that the said explosion occurred between the Daleway end and the greaser; but what caused the ignition there is not sufficient evidence to show."

One of the victims, named Luke, who afterwards died from his injuries, made a statement to the effect that a shot was fired in one of the main intake airways not far from the bottom of the down-cast shaft, at the instant the explosion took place. The person who, according to Luke's statement, ignited the shot, still survives, and denies having done so, although he admits having fired a shot near the same place a short time previously. Some of the experts, including the two inspectors of mines, came to the conclusion that Luke's statement was the more probable; others were unable to concur with them in this. The evidences of violence point to the place indicated by Luke as having been the origin of the explosion. A good deal of discussion took place between some of the examining counsel and solicitors and some of the witnesses, as to whether coal-dust alone in the absence of fire-damp could originate and carry on an explosion, but nothing new was elicited in this respect. All agreed that there could not have been any gas present at the point where the shot was said to have been fired. Mr. G. Baker Foster was "quite of opinion that there had been no gas; . . . he could not imagine that in such an intake, with such ventilation, and such a position, gas could accumulate for a minute." Mr. Bell, the Inspector of Mines for the district, said:—"The ventilation throughout the pit was good. It was a well-managed pit, and the last in which he would have expected an explosion to take place." Mr. W. M. Atkinson, the Assistant-Inspector, said:—"The explosion was confined to those parts of the pit least likely to contain gas, and where there was the most coal-dust. It was highly improbable that there was any fire-damp where the explosion originated. He once examined the place when the barometer was as low as 27·5 inches, and no trace of fire-damp could be detected." (The barometer stood at 29·55 inches at 1 a.m., two hours before the explosion.) "He believed the explosion was entirely due to the combustion of coal-dust in pure air, and that its ignition was caused by a shot fired by Johnson. A blown-out shot would not be necessary. Wherever there had been coal-dust in the mine the explosion had gone; but wherever there was an absence of coal-dust,

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there the explosion ceased." The last statement was not called in question by anyone, and stands unimpeached.

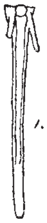
Those witnesses who would not go the length of saying that coal-dust alone in the absence of fire-damp had caused the explosion, had no explanation of their own to offer. The "outburst of gas," the cry which used to be so often adopted in similar cases, was not entertained by anyone in this case. Some of the witnesses were unable to accept the coal-dust theory on account of preconceived notions regarding it; others had read in books and papers certain statements which prevented them from adopting it; and one (Mr. Lishman, the manager of Elemore Colliery) had made experiments, with an apparatus similar to one of mine, which did not lead to conclusive results. With these conflicting opinions before them, the jury arrived at the conclusion that the men had been killed by *an explosion*, but, with the characteristic caution of men of the North, they refrained from stating what it was that had exploded.

Cardiff, February 3 W. GALLOWAY

Abnormality in the Urostyle of the Common Frog

ATTENTION has recently been drawn to abnormalities in the vertebral column of Rana. (See Bourne, *Quarterly Journal of Microscopical Science*, January 1884; Howes, *Anatomischer Anzeiger*, 1 Jahrgang, 1886, Nr. 11; Lloyd Morgan, NATURE, November 1886.) One form of such abnormality is the addition of a supernumerary (tenth) vertebra.

I wish here to record the occurrence, in the skeleton of a large *Rana temporaria*, of an abnormal urostyle, bearing at its anterior end a larger (right) and a smaller (left) transverse process. These are shown in the accompanying figures. Fig. 2 shows a tendency, in the dorsal moiety, towards a segmentation of the urostyle and and the separation of a supernumerary vertebra. The coccygeal foramina lie just behind the transverse processes.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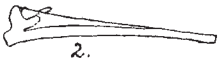
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This case is interesting as showing an incompletely separated tenth vertebra, and as bringing an abnormal Rana into relation with a normal Discoglossus. C. LLOYD MORGAN

University College, Bristol

The Cambridge Cholera Fungus

I HAVE read with much interest the correspondence on the above subject in your issue of January 27 (p. 295). In the new edition of my work on bacteriology, to be issued, I hope, before many days, will be found the following statement:—

"At a meeting of the Physiological Society, held May 15, 1886, at Cambridge, a preliminary communication was made upon the investigations in Spain, referred to in the first edition of this work. The observations made by Roy, Brown, and Sherrington rather tend, in the opinion of the author, to confirm Koch's views. Comma-bacilli were found to be present in some cases in enormous numbers, and the frequency of their occurrence led these observers to believe that they must bear some relation to the disease. At the same time, as they failed to find them in all cases, they regarded the existence of a causal relation as not proven. They failed to find the Naples bacterium or the small straight bacillus noted by Klein, but they drew attention to certain peculiar mycelium-like threads in the mucous membrane of the intestines. These organisms, however, judging from a preparation stained with methylene-blue which was exhibited at the meeting, appeared to the author to much more closely resemble some of the involution-forms of comma-bacilli, *filaments à masses globuleuses*, figured by Van Ermengem, than anything else he had seen. Yet assuming these peculiar structures to belong, as described, to some species of Chytridiaceæ, it is very doubtful whether they can be considered to be of any significance. Methylene-blue has been employed by Koch and others, including the author, for staining sections of the intestine from cholera cases, and had they been constantly present, it is hardly possible that such striking objects could have been overlooked. Again, we must bear in mind that hyphomycetous fungi have been found occasionally to occur saprophytically in the intestinal canal, as well as in the lungs, external auditory meatus, and elsewhere. We must, however, wait before expressing a more definite opinion, until the Report of these observers is published in full."

This, I think, may explain Mr. Gardiner's difficulty. Very probably the same preparation was shown to him, as his second opinion coincides with the conclusion I arrived at last May. I have now before me the Proceedings of the Royal Society, No. 247, and I am greatly puzzled by the illustrations, for they certainly appear to represent a branching mycelium, and do not in the least recall to my mind the preparation which I had an opportunity of examining. EDGAR CROOKSHANK

Eastbourne, January 31

Low Barometric Readings

IN a Note in NATURE of December 16 (p. 157) you observe that the barometric reading of 27·333 inches (reduced to sea-level) recorded at Ochtertyre, Perthshire, on January 26, 1884, is the lowest observed by man anywhere on the land surface of the globe. This, however, is not the case. The cyclone which on the morning of September 22, 1885, swept over False Point, on the coast of Orissa, gave the lower readings 27·135 at the beginning of the central calm, and 27·154 half an hour later (both readings reduced to 32° and sea-level). These readings are perfectly authentic, the instrument being a Casella's observatory standard (on Fortin's principle) that has been verified with the Calcutta standard and is corrected to that standard, which is 0·011″ higher than the Kew standard. Its elevation above the sea, 20·6 feet, has been determined by spirit-level; and the observer, Mr. Workman, is one of the best of those who keep a regular meteorological register for this department. The above are the lowest of a series of readings, taken at intervals throughout the storm, which was then travelling at the rate of thirteen miles an hour.

The storm will be long remembered as that in which the settlement of Hookeytollah, six miles to the north of False Point lighthouse, together with its inhabitants, was swept away by the storm-wave accompanying the cyclone. At False Point station the water rose 22 feet above mean sea-level directly after the passage of the storm centre. The country inundated lay to the north of the lighthouse, and is a low-lying alluvial tract from 4 to 5 feet above mean sea-level, intersected by a network of salt-water tidal creeks.

The destruction that ensued was very great. Including the small settlement of Hookeytollah, some two thousand households were swept away, representing a loss of from six to ten thousand souls. Crops valued at ten lakhs of rupees (100,000*l.*) were irretrievably damaged and lost; the wells and tanks of drinking-water were rendered unfit for use; and about 60,000 acres of land rendered unfit for cultivation for two or three years to come. But even this is very small in comparison with the destructive effects of the Calcutta cyclone of October 5, 1864, and those of the Backerganj cyclone of November 1, 1876.

HENRY F. BLANFORD

Indian Meteorological Office, Calcutta, January 6

Magnetic Theory

MR. WATSON asks, What is the physical evidence in favour of the existence of A, B, C, and α, β, γ? With regard to the former the evidence, derived from the permanence of the magnetisation in a small piece of a hard steel magnet, seems to me almost conclusive; while the following consideration tells very strongly in favour of α, β, γ.

To determine the mechanical force and couple acting on a magnetic element placed in a magnetic field in air, we treat it as consisting of two equal and opposite poles very near together, and find the resultant of the forces on these two poles. It may be proved without difficulty that the same process may be used to find the mechanical force and couple, arising from magnetic causes, acting on an element within the mass of a magnet. In the first case we may, of course, employ either α, β, γ, or a, b, c, as the forces acting on a unit pole. But in the second case we

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